ISWA Position Paper to the EU Commission on the emission limit values for Waste-to-Energy Plants and Cement Kilns (co-disposal)

10 February 2005

SWA would like for environmental reasons to highlight the differences in emission limit values for waste incineration in a dedicated waste-to-energy plant and for co-incineration in a cement kiln.

The EU Waste Incineration Directive (2000/76/EC) defines emission limit values to the air both for dedicated waste-to-energy plants (Annex V) as well as for cement kilns (Annex II.1.).

There are, however, seven reasons why co-incineration of waste in a cement kiln can lead to a higher level of emissions to the air than emissions from a dedicated waste-to-energy plant:

1. Some limit values are higher for cement kilns than for waste-to-energy plants.
2. Cement Kilns are in principle given an "emission quota" by getting special limit values, which, if they are complied with, will lead to a higher contamination level than if it was operating on fossil fuels.
3. The requirements for measuring emission levels are less restricted (cement kilns only have to comply with daily average values, while dedicated waste-to-Energy plants have to comply with half-hourly average values).
4. There are no requirements regarding auxiliary burners on a co-incineration plant.
5. As the residues are part of the final cement there are no requirements concerning the residues from waste incinerated in a cement kiln, which means a dilution of contaminating components in the end product.
6. Neither the BREF-note for cement production nor the draft BREF-note on incineration includes co-incineration of waste in a cement kiln, which therefore does not have a defined BAT.
7. Cement kilns very seldom recover surplus energy and therefore the environmental impacts in relation to energy output are higher for cement kiln than for dedicated waste-to-energy plants with full energy recovery.

1) Some limit values are higher for cement kilns than for waste-to-energy plants

The special limit values1, which exists for cement kilns is higher than the same limit value for incineration plants in the case of dust and NOx parameters. Especially for existing cement kilns have been given a very high level of NOx – value, which is permanent (800mg/Nm³) compared with

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1 Note that at the reference value for oxygen in the special limit values for cement kiln is 10%, while the same reference value for waste incineration plants is 11%. This is primary because the cement kiln typically operates with lower air surplus than waste incineration plants, but this also means that the emission limit values for cement kilns in general are in the order of 10% lower than those of the incineration plants. This however only have any importance in the case where the cement kiln is operating a 100% with waste. With typically 10% input from waste the difference will be negligible.
incineration plants with 200 mg/Nm$^3$ in general). The dust limit values for cement kilns is 30 mg/Nm$^3$ compared to 10 for the incineration plants.

2) Cement Kilns are in principle assigned a “emission quota” by getting special limit values, which, if they are complied with, will lead to a higher contamination level than if it was operating on fossil fuels.

The directive assigns cement kilns special aggregated emission values instead of following the procedure described in the introduction to the Annex II of the Directive. This provides for the use of a calculation formula, where the resulting limit value for co-incineration is calculated relatively from the emissions from the original fuel and from the waste. This can be regarded as a deviation from the main principle of the Directive that waste incineration in co-incineration plants is not supposed to result in higher emissions than dedicated incineration plants.

The cement kiln in this way according to the directive is assigned a “emission quota”, because the emissions from the existing incineration processes are not acknowledged. If in the status quo position there is no emission of cadmium or other toxic metals, for example, in the cement kiln this could result in the possibility of emission of a relatively large amount of these substances, no matter how much waste is incinerated in the kiln.

This will ceteris paribus lead to a dilution of these contaminating components.

3) The requirements for measuring emissions are less restrictive (cement kilns only have to comply with daily average values, while dedicated waste-to-energy plants have to comply with half-hourly average values).

The special rules for cement kilns in the Annex II.1. of the Directive implies that there is only a requirement of complying with daily average values, while dedicated incineration plants have to comply with half-hourly average values, which in practice is much more difficult. Therefore the dedicated incineration plants during normal operations have to seek to lower their emissions to a level far under the values given in the directive, which on a yearly basis means that the emissions are far under the daily average requirement.

The cement kilns do not have the same incentive for optimising their operations and will only be directed towards the compliance with the daily average values, which is possible. Even with large hourly deflections this can be accommodated but in total this will lead to higher emissions levels.

4) There are no requirements regarding auxiliary burners on a co-incineration plant.
Article 6, item 1 requires installation of auxiliary burners in dedicated incineration plants (however with a dispensation possibility in 6.4), while article 6, item 2 is not requiring such installations for co-incineration plants (only a functionality requirement).

This could *ceteris paribus* lead to higher emissions from last-mentioned.

5) **If the residues are part of the final cement there are no requirements concerning the residues from waste incineration in a cement kiln, which means a dilution of contaminating components into the end product.**

The article 9 in the incineration directive states that residues shall be minimised but leaves it up to the Member States to set the specific requirements to the physical and chemical properties and contaminating potential.

There are no requirements for the residue and the contaminating components in the waste input in cases where the residue from a co-incineration plant is part of the final product from a co-incineration process, as is the case with cement production. The residues can therefore legally be diluted out in the final product which can be used without further control.

6) **Neither the BREF-note for cement production nor the draft BREF-note on incineration includes co-incineration of waste in a cement kiln, which therefore does not have a defined BAT.**

In the preamble item 13 of the Incineration Directive it is states that the “compliance with the emission limit values laid down by this Directive should be regarded as necessary but not sufficient condition for compliance with the requirements of Directive 96/61/EC. Such compliance may involve more stringent emissions limit values for other substances and other media, and other appropriated conditions”.

The Waste Incineration Directive therefore, in the perspective of IPPC Directive, has to be looked upon as a minimum directive. The values are assumed to be more stringent in the BREF on incineration, which also turned out to be correct in the draft BREF, where the so called Best Available Techniques Associated Operational Emission Levels are a factor two below the Emission Limit Values (ELV’s) of the Directive.

The draft BREF note on incineration omits the co-incineration of waste on non-dedicated incineration plants. The BREF note on cement kilns also omits co-incineration of waste. Therefore cement kilns operating with waste are not regulated in any BREF and therefore will not be submitted to the increasingly stringent requirements in the IPPC Directive and also the stringency of the preamble of the Incineration Directive.

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2 Directive 96/61/EC is the IPPC Directive
7) Cement kilns very seldom have recovery of surplus energy, which is why the environmental impacts measured in relation to energy output are higher for cement kilns than for dedicated waste-to-energy plants with full energy recovery (typically 90% energy efficiency)

Article 6.6. in the Incineration Directive states that "any heat generated by incineration or the co-incineration process shall be recovered as far as practicable"

In practice a modern waste-to-energy plant recover around 90% of the energy input by generating electricity and heat, while cement kilns very seldom recover any surplus heat. This means that the emissions of contaminating substances to the environment per produced amount of energy *ceteris paribus* is higher from cement production using co-incineration than from dedicated incineration plants – no matter if emission concentrations measured in mg/Nm3 are the same.

In the light of the above mentioned environmental aspects ISWA will advise the Commission to look closely at this and to initiate an amendment that cement kilns should meet the same requirements as the waste-to-energy plants, when it comes to emission level values when operating on waste.